REMARKS

Claims 1, 4, 6, 8-17 and 63 are pending in the Application.

Claims 1, 4, 6, 8-17 and 63 are rejected.

1. Rejections Under 35 U.S.C. §103(a) over Smalley in view of Hampden-Smith

The Examiner has rejected Claims 1, 6, 8-17 and 63 under 35 U.S.C. § 103(a) as being unpatentable over Smalley et al., U.S. Patent Publication 2005/0249656 A1 ("*Smalley*") in view of Hampden-Smith et al., U.S. Patent Publication 2003/198849 A1 ("*Hampden-Smith*"). Office Action at page 2.

Applicant respectfully traverses the rejection.

In *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007), the Supreme Court noted that the obviousness analysis under § 103 should be explicit, and that it is important to determine whether there is "an apparent reason to combine the known elements in the fashion claimed . . . ." *Id.*, 127 S. Ct. at 1741.

Smalley does not teach or suggest a fuel cell electrode. Furthermore, neither *Smalley* nor *Hampden-Smith* suggests all the elements of Claim 1 which requires a fuel cell electrode comprising a combination of carbon powder or carbon black together with a plurality of carbon nanotubes, wherein the carbon nanotubes comprise single-wall carbon nanotubes having a diameter of about 0.7 – 3.5 nm, wherein the single-wall carbon nanotubes are derivatized with a functional group, and wherein the plurality forms a mat of carbon nanotubes and carbon powder or carbon black, wherein the mat has a planar area and wherein the mat has a thickness greater than one micron and a catalyst metal comprising platinum (Pt) in contact with the mat of carbon nanotubes and carbon powder or carbon black, wherein the catalyst metal is present in an amount

less than 400 $\mu g/cm^2$ of the planar area of the mat of the carbon nanotubes and carbon powder or carbon black, and wherein the electrode provides greater than 1 mA/cm^2 per μg Pt/cm^2 of the planar area of the mat of carbon nanotubes and carbon powder or carbon black.

Furthermore, even if the teachings of *Smalley* and *Hampden-Smith* were combined, the combination would not achieve all the limitations of Claim 1, particularly the combination of carbon nanotubes with carbon black or carbon powder. The mentions of carbon black in *Smalley* and *Hampden-Smith* do not suggest or provide motivation for the combination of Claim 1. None of the mentions of carbon black in *Smalley* at paragraphs 59 and 229 or in *Hampden-Smith* at paragraphs 15, 196, 198, 313, 333, 362, 442, 443 and 445 relates to or suggests a combination of single-wall carbon nanotubes with carbon black or carbon powder in a fuel cell electrode. The Examiner noted one mention of carbon black in *Smalley*, at paragraph 59, however, this relates to tires for motor vehicles rather than a fuel cell electrode.

> The carbon nanotubes may be used in place of or in conjunction with carbon black in tires for motor vehicles.
>
> *Smalley* at par. 59.

The other mention of carbon black in *Smalley*, at paragraph 229, discloses "carbon black pyrolyzed coal," which does not relate to a fuel cell electrode or to a combination of carbon nanotubes with carbon black or carbon powder.

The mentions of carbon black in *Hampden-Smith* are at paragraph 15, which discloses carbon black as a support material; at paragraph 196, which discloses "carbon based lubricants that are a suspension of fine carbon particles, commonly referred to as carbon black," and "acetylene carbon blacks having high chemical purity and good electrical conductivity;" at paragraph 198, which discloses the "wetting of the carbon black powder;" at paragraph 313, which discloses a "graded hydrophobicity layer can consist of a single sublayer with 35 wt. %

TFE fluorocarbon polymer and 65 wt. % carbon black;" at paragraph 333, which discloses the particular sources of acetylene carbon black and furnace carbon black; at paragraph 362, which discloses a carbon black support; and at paragraphs 439, 442, 443 and 445, which disclose a polymer-modified carbon black.

Neither of the references provides motivation for one of ordinary skill in the art to modify the teachings of *Smalley* with those of *Hampden-Smith*, and if, for the sake of argument, the combination was made, such combination would not result in all the elements required by Claim 1. Thus, Claim 1 is not obvious over *Smalley* in view of *Hampden-Smith*.

Claim 6, 8-17 and 63 are dependent upon herein Claim 1 and are not obvious for the same reasons.

In light of the foregoing, Applicant respectfully requests that the Examiner withdraw the rejection of Claims 1, 6, 8-17 and 63 under 35 U.S.C. § 103(a).

2. Rejections Under 35 U.S.C. §103(a) over Smalley in view of Hampden-Smith and further in view of Fisher

The Examiner has rejected Claim 4 under 35 U.S.C. § 103(a) as being unpatentable over *Smalley* in view of *Hampden-Smith* and further in view of Fisher et al., U.S. Patent 6,203,814 ("*Fisher*"). Office Action at page 6.

Applicant respectfully traverses the rejection.

Neither *Smalley, Hampden-Smith,* nor *Fisher* teaches or suggests all the elements of Claim 1. Therefore, even if the teachings of *Smalley, Hampden-Smith* and *Fisher* were combined, the combination would not achieve all the limitations of Claim 1.

Claim 4 is dependent upon Claim 1. Therefore, Claim 4 is not obvious for the same reasons that Claim 1 is nonobvious.

In light of the foregoing, Applicant respectfully requests that the Examiner withdraw the rejection of Claim 4 under 35 U.S.C. § 103(a) as being unpatentable over *Smalley* in view of *Hampden-Smith* and further in view of *Fisher*.

4. Conclusion

As a result of the foregoing, Applicant asserts that the Claims are now in condition for allowance.

The Examiner is invited to contact the undersigned attorney at (713) 934-4094 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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